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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/977,207	10/16/2001	Hideo Miura	500.34397CV2	4397

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EXAMINER	
MALDONADO, JULIO J	
ART UNIT	**PAPER NUMBER**
2823	

DATE MAILED: 11/19/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/977,207	MIURA ET AL.	
	Examiner	Art Unit	
	Julio J. Maldonado	2823	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *24 June 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *15-27* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *23-27* is/are allowed.

6)☒ Claim(s) *15-22* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

13)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

a) ☐ The translation of the foreign language provisional application has been received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____.
4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other:

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 06/24/2003 has been entered.

Allowable Subject Matter

2. The indicated allowability of claims 23-27 is withdrawn in view of the newly discovered reference(s) to Kunikiyo (U.S. 5,668,403). Rejections based on the newly cited reference(s) follow.

Claim Rejections - 35 USC § 102

> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claims 18-20 are rejected under 35 U.S.C. 102(e) as being anticipated by Kunikiyo (U.S. U.S. 5,668,403).

In reference to claim 18, Kunikiyo (Figs.1-10) in a related method to form an element isolation oxide film teaches oxidizing a main surface of a silicon substrate (1); forming an oxidation-preventing film (3) on portions of the oxidized silicon substrate; removing a part of the oxidation-preventing film (3) that is located in an element-

separating area; forming an element-separating oxide film (7) on the silicon substrate in the element-separating area after removing the part of the oxidation-preventing film (3); after forming the element-separating oxide film (7), carrying out a heat-treatment at a temperature of 800°C or higher in an inert atmosphere; and which further comprises forming a gate oxide film over the heat-treated silicon substrate (column 8, line 11 – column 9, line 44).

Kunikiyo fails to expressly teach forming a thermal oxide on the silicon substrate by oxidizing the silicon substrate; and after forming the thermal oxide, carrying out the heat treatment. However, the thermal oxidation step is not distinguishable form the element separating oxide. They could reasonably be one and the same step. Therefore, Kunikiyo reads on the claim.

In reference to claim 19, Kunikiyo teaches wherein the heat treatment is carried out in an atmosphere of an inert gas selected from nitrogen, said gas mixture being able to contain 5% or less of oxygen (Kunikiyo, column 8, lines 24 – 27, and column 10, lines 53 – 64).

In reference to claim 20, Kunikiyo teaches wherein the oxide film is kept in a bare state during the heat-treatment for stress relaxation (Kunikiyo, column 8, lines 20 – 49).

4. Claims 15-17 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kunikiyo (U.S. 5,668,403) in view of Chiu et al. (U.S. 5,470,783).

In reference to claims 15 and 21, Kunikiyo (Figs.1-10) in a related method to form an element isolation oxide film teaches forming an element-separating oxide film (7) on a silicon substrate (1) by thermal oxidation, and thereafter carrying out a heat-treatment

at a temperature of not lower than 800°C while keeping a surface of the oxide film in an inert atmosphere, followed by formation of a gate oxide film, introduction of impurities, formation of electrodes and wiring, and formation of an insulating film so as to form a transistor, wherein the heat-treatment of the oxide film is carried out after removal of an oxidation preventing film (3) (column 8, line 11 – column 9, line 44).

Kunikiyo fails to teach wherein the thermal oxidation is carried out at least in an atmosphere of a gaseous mixture of hydrogen and oxygen or in an atmosphere of H_2O. However, Chiu et al. (Figs.1-6) in a related method to form a field oxide teach forming an element-separating oxide film (40) in an atmosphere of a gaseous mixture of hydrogen and oxygen or in an atmosphere of H_2O (column 6, lines 1-11). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of Kunikiyo and Chiu et al. to enable forming the element-separating oxide film of Kunikiyo as taught by Chiu et al.

In reference to claim 16, the combined teachings of Kunikiyo and Chiu et al. teach wherein the heat treatment is carried out in an atmosphere of an inert gas selected from nitrogen, said gas mixture being able to contain 5% or less of oxygen (Kunikiyo, column 8, lines 24 – 27, and column 10, lines 53 – 64).

In reference to claim 17, the combined teachings of Kunikiyo and Chiu et al. teach wherein the oxide film is kept in a bare state during the heat-treatment for stress relaxation (Kunikiyo, column 8, lines 20 – 49).

Allowable Subject Matter

5. Claims 23-27 are allowed.

6. The following is a statement of reasons for the indication of allowable subject matter:

Kunikiyo (Figs.1-10) in a related method to form an element isolation oxide film teaches oxidizing a main surface of a silicon substrate (1); forming an oxidation-preventing film (3) on portions of the oxidized silicon substrate; removing a part of the oxidation-preventing film (3) that is located in an element-separating area; forming an element-separating oxide film (7) on the silicon substrate in the element-separating area after removing the part of the oxidation-preventing film (3); after forming the element-separating oxide film (7), carrying out a heat-treatment at a temperature of 800°C or higher in an inert atmosphere; and which further comprises forming a gate oxide film over the heat-treated silicon substrate (column 8, line 11 – column 9, line 44).

Kunikiyo fails to expressly teach forming a thermal oxide on the silicon substrate by oxidizing the silicon substrate; and after forming the thermal oxide, carrying out the heat treatment. However, the thermal oxidation step is not distinguishable form the element separating oxide. They could reasonably be one and the same step. Therefore, Kunikiyo reads on the claim.

Still Kunikiyo neither teaches nor suggests forming the thermal oxide; forming a gate electrode on the thermal oxide film; and after forming the gate electrode film, carrying out a heat-treatment at a temperature of 800° or higher in an inert atmosphere.

Response to Arguments

7. Applicant's arguments with respect to claims 15-17 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

8. Papers related to this application may be submitted directly to Art Unit 2823 by facsimile transmission. Papers should be faxed to Art Unit 2823 via the Art Unit 2823 Fax Center located in Crystal Plaza 4, room 3C23. The faxing of such papers must conform to the notice published in the Official Gazette, 1096 OG 30 (15 November 1989). The Art Unit 2823 Fax Center number is **(703) 305-3432**. The Art Unit 2823 Fax Center is to be used only for papers related to Art Unit 2823 applications.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to **Julio J. Maldonado** at **(703) 306-0098** and between the hours of 8:00 AM to 4:00 PM (Eastern Standard Time) Monday through Friday or by e-mail via julio.maldonado@uspto.gov. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Olik Chaudhuri, can be reached on (703) 306-2794.

Any inquiry of a general nature or relating to the status of this application should be directed to the **Group 2800 Receptionist** at **(703) 308-0956**.

JMR
11/14/03

George Fourson
Primary Examiner